

REMARKS

STATUS OF CLAIMS

Claims 1-24 are pending and stand rejected.

By this Amendment claims 1-24 are amended and new claims 25-27 are added. Therefore, claims 1-27 are now under consideration.

No new matter is presented by the drawing, specification and claim amendments and new claims and, accordingly same are submitted to be proper, and entry and approval are respectfully requested.

SPECIFICATION AMENDMENT

Applicants have amended the specification to correct typographical errors therein.

Entry and consideration are respectfully requested.

DRAWING OBJECTION

In the Action at page 2, item 2, Figs. 4A, 4B, 6A and 6B are objected to, the Examiner contending that these figures should be designated by a legend such as --Prior Art--.

Applicants have provided replacement sheets which include the legend --Prior Art-- in Figs. 4A and 6A. However, Applicant traverses the objection to Figs. 4B and 6B. Figs. 4B and 6B show a technique for analyzing the conventional frame structure of Figs. 4A and 6A, respectively, in developing the present invention and thus, Figs. 4B and 6B are not prior art.

REJECTION OF CLAIMS 9 AND 21 UNDER 35 U.S.C. §112, ¶2

In the Action at pages 2 and 3, item 4, claims 9 and 21 are rejected under 35 U.S.C. §112, ¶2 for insufficient antecedent basis.

Claims 9 and 21 are amended to overcome the rejection under 35 U.S.C. §112, ¶2.

Reconsideration is respectfully requested.

ITEM 6: REJECTION OF CLAIMS 1-2, 5-6, 10-14, 17-18 AND 22-24 UNDER 35 U.S.C. § 102(e) AS BEING ANTICIPATED BY TANAKA

In the Office Action at page 3, item 6, claims 1-2, 5-6, 10-14, 17-18 and 22-24 are rejected under 35 U.S.C. §102(e) as being anticipated by Tanaka (U.S. Patent No. 6,552,701). Claim 21 is not listed as a rejected claim in item 6, however, in the body of this

rejection at page 4, item 9, claim 21 is rejected. Accordingly, Applicants will provide arguments for patentability of claim 21 over Tanaka.

Reconsideration of the rejection is respectfully requested.

Claim 1

Claim 1 describe an arrangement of subfields in a frame, for example, as shown in the present application at Fig. 11A. As shown in the Fig. 11A, the frame is constituted by eight subfields. The brightness ratio among the subfields is set to 1:2:4:8:16:32:64:128. That is, the brightness ratio among the subfields is a conventional typical one and the two brightest subfields have different brightnesses. However, contrary to an arrangement of subfields in a conventional frame, in an arrangement of subfields shown in Fig. 11A, the two brightest subfields (i.e., having brightnesses of 128 and 64, respectively) are arranged at an interval of about half a length of the frame. Flicker associated with the arrangement shown in Fig. 11A is smaller than flicker associated with the conventional frame.

Tanaka Reference

Fig. 1 of Tanaka show a conventional typical arrangement of subfields. The brightness ratio of the subfields is similar to the subfields shown in Fig. 11A of the present application, however, in Fig. 1 of Tanaka, the two brightest subfields are arranged contiguously. Therefore, Tanaka does not disclose or suggest the recitation in claim 1 of "two brightest subfields in said frame have different brightness, and the two brightest subfields are arranged at an interval of about half a length of said frame." Further, Tanaka shows many other arrangements of subfields in Figs. 3-6 and 9-12, however, the two brightest subfields of each of the other arrangements have the same brightness. Thus, the other arrangements of subfields in Figs. 3-6 and 9-12 are different from the arrangement recited in claim 1.

Further, according to the recitation of claims 1, the flicker is reducible in a subfield arrangement having a conventional brightness ratio among the subfields (e.g., a brightness ratio set to 1:2:4:8:16:32:64:128). However, Tanaka does not disclose or suggest improvement of flicker in such a conventional subfield arrangement, since in the Tanaka display device a subfield arrangement in which "first and second gradation bit groups" are obtained "by dividing ... gradation bits from the most significant bit into two halves so as to make weights thereof half ... [and] arranging a plurality of sub-fields in said first and second gradation bit groups so as to be equal to each other." (See Tanaka at claim 1.) This means that subfield arrangement of the Tanaka display device does not have a conventional brightness ratio among the subfields (e.g., the brightness ratio of the subfields in FIG. 3 of

Tanaka is 1:2:4:8:8:8:16:32:32:64:64).

Accordingly, claim 1 patentably distinguishes over Tanaka and is submitted to be allowable.

Claim 13

Claim 13 for reasons similar to those of claim 1, is also submitted to be allowable.

Claim 2

Claim 2 recites "subfields of Bn-2 brightness and Bn-3 brightness among said n subfields are arranged at the interval of about half the length of said frame so that each of the subfields of the Bn-2 brightness and the Bn-3 brightness (i.e., the third and fourth brightest subfields, respectively) is positioned almost at a midpoint between two most brightness-weighted subfields. For example, Fig. 9A of the present application shows such an arrangement of subfields in a frame. As shown in the Fig. 9A, the two brightest subfields Bn and Bn-1 of a brightness of 24 are arranged at an interval of about half a length of the frame. Further, the next brightest subfields Bn-2 and Bn-3 of a brightness of 16 are arranged at the interval of about half the length of the frame so that each of the subfields of the Bn-2 and Bn-3 brightnesses is positioned almost at a midpoint between the two most brightness-weighted subfields (i.e., subfields Bn and Bn-1).

In the Action at page 3, line 21 to page 4, line 2, the Examiner contends that:

the subfields SF1 and SF2 of brightnesses $B = 64$ and $B = 32$ are arranged at the interval of about half the length of said frame, about $(1/2 \pm 1/14)$ frame; and the subfields SF3 and SF4 of brightnesses $B = 16$ and $B = 8$ are arranged at the interval of about half the length of said frame and at the position (sic) almost at the midpoint between said most brightness weighted subfields SF1 and SF2; see figure 5, col. 4, line 14 to col. 5, line 14.

However, the Examiner is incorrect. According to Tanaka, Fig. 5 shows a total constitution of each field (i.e., corresponding to a frame in the present invention). (See Tanaka at FIG. 5 showing a field and, in particular, the label of --ABOUT $(1/2 \pm 1/14)$ FIELD-- shown extending across approximately half of the field. Therefore, in Fig 5 of Tanaka one field has twelve subfields and two brightest subfields of brightness $B = 64$ correspond to SF1 and SF2 and the two next brightest subfields of brightness $B = 32$ correspond to SF3 and SF4. In Fig. 5 of Tanaka the two brightest subfields SF1 and SF2 are arranged at an interval of about half a length of the field. However, the third and fourth brightest subfields SF3 and SF4 are, respectively, arranged neighboring the brightest subfields SF1 and SF2 and, in particular, the third and fourth brightest subfields SF3 and SF4 are not positioned almost at a

midpoint between the two most brightness-weighted subfields. Thus, Tanaka does not disclose or suggest the above-mentioned recitation of claim 2.

Accordingly, claim 2 patentably distinguishes over Tanaka and is submitted to be allowable.

Claim 14

Claim 14 for reasons similar to those of claim 1, is also submitted to be allowable.

Claim 5

According to the invention recited in claim 5, "a total number of lit pulses in the frame is varied by varying an original clock frequency which generates an execute signal." Thus, a frequency period of each address pulse or each sustain pulse is varied to vary a number of pulses in a predetermined period (e.g., an address period or a sustain period).

In the Office Action at page 4, lines 5-8, the Examiner cites the disclosure of Tanaka at column 6, lines 47-60 as teaching "when the total number of lit pulses in a frame is varied, in accordance with the gradation scale, the original clock frequency (e.g., the vertical synchronization signal, a system clock), which generates an execute signal in said light period, is varied ("output various timing signals (sic)").

Applicants believe that the Examiner may have misunderstood the disclosure of Tanaka, since Tanaka is silent regarding the recitation in claim 5 of "when a total number of lit pulses in the frame is varied, an original clock frequency is varied." In the Tanaka display device, various timing signals are output from the sub-field generating portion 31, however, nothing in Tanaka discloses or suggests that varying the total number of lit pulses in the field thereby varies any of the various timing signals.

Accordingly, claim 5 patentably distinguishes over Tanaka and is submitted to be allowable.

Claims 10, 17 and 22

Claims 10, 17 and 22 for reasons similar to those of claim 5, are also submitted to be allowable.

Claims 6, 11, 18 and 23

Claims 6, 11, 18 and 23 are also submitted to be allowable for their respective dependencies on claims 5, 10, 17 and 22, as well as for the additional recitations therein.

Claim 9

According to the invention recited in claim 9, "plural subfields are classified into a front subframe and a rear subframe so that one of two most brightness-weighted subfields belongs to said front subframe and a remaining one of the two most brightness-weighted subfields belongs to said rear subframe, and an interval between respective start timings of said front subframe and said rear subframe remains fixed, regardless of variations in length of either or both of the front and rear subframes." For example, Fig. 13A of the present application shows such an arrangement of subfields in a frame. As shown in the Fig. 13A, one of the two most brightness-weighted subfields (i.e., having a brightness weight of 24) is arranged in a front subframe and the remaining one of the two most brightness-weighted subfields (i.e., also having a brightness weight of 24) is arranged in a rear subframe. Further, an interval between respective start timings of the front subframe and the rear subframe remains fixed, regardless of variations in length of either or both of the front and rear subframes.

Tanaka Reference

In the Office Action at page 4, lines 11-16, the Examiner contends that "the most brightness-weighted subfield, B=64 belongs to said front subframe, and the second most brightness-weighted subfield, B=32 belongs to said rear subframe, see figure 3."

As previously mentioned, Fig. 3 of Tanaka shows a total constitution of each field (i.e., corresponding to a frame of the present invention), and one field has twelve subfields with two subfields of brightness $B = 64$ correspond to SF1 and SF2. One of two brightest subfields SF1, in Fig. 3 of Tanaka, is arranged in a front portion and a remaining one of the two brightest subfields SF2 is arranged in a rear portion. Fig. 3 of Tanaka does not disclose or even suggest an interval between front and rear portions of the field, which remains fixed, regardless of variations in length of either or both of the front and rear subframes. Thus, it is impossible to fix the interval between respective start timings of the front and rear portions of the field in the Tanaka display device, since, for example, if a length of the front portion of the field is varied, the interval between the respective start timings of the front and rear portions of the field must also vary.

Accordingly, claim 9 patentably distinguishes over Tanaka and is submitted to be allowable.

Claim 21

Claim 21 for reasons similar to those of claim 9, is also submitted to be allowable.

Claim 12

According to the invention recited in claim 12, "plural arrangement orders of said plural subfields in said frame are memorized in accordance with the types of images to be displayed, and display is performed with an arrangement order in said subfield selected from said plural arrangement orders according to judged types of the images."

Tanaka Reference

In the Office Action at page 4, line 16-18, the Examiner contends that Tanaka teaches "the plural or arrangement orders of said plural subfields in said frame are memorized ... [and] the plural subfields of that field are arranged in a plurality of arrangement (sic) orders."

However, Tanaka at most discloses:

A memory I/O controlling portion 24 is an input/output (I/O) buffer for controlling reading/writing between the frame buffer memory 25 and stages before or after the memory. The data, which have been read out from each of sub-fields and represent each of the gradation bits of the video signals, are converted into a final arrangement of data via the aforementioned memory I/O controlling portion 24 by a second data sorting portion 26. Then, the data that have been converted by the second data sorting portion 26 are outputted to, for example, two channels of data drivers 27, 28.

(Tanaka at column 6, lines 36-46). Thus, Tanaka is silent regarding plural arrangement orders of the plural subfields being memorized and, furthermore, is silent regarding judgment of types of images.

Accordingly, claim 12 patentably distinguishes over Tanaka and is submitted to be allowable.

Claim 24 for reasons similar to those of claim 12, is also submitted to be allowable.

REJECTION OF CLAIMS 3-4, 7-8, 15-16 AND 19-20 UNDER 35 U.S.C. § 103(a)

In the Office Action at pages 5-6, item 11, claims 3-4, 7-8, 15-16 and 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of Fujisaki et al. (U.S. Patent No. 5,973,655).

Claim 3

According to the invention recited in claim 3, "when a rest period occurs in said frame because a total length of said plural subfields is shorter than that of said frame, said rest period is divided into plural rest periods and the divided rest periods are arranged between different plural subfields."

Tanaka Reference

In the Office Action at page 5, lines 16-18, the Examiner concedes that "Tanaka does not teaches that the rest period is divided in plural rest periods and the divided rest periods are arranged between the different subfields."

It is submitted that claim 3 patentably distinguishes over Tanaka for the above-noted reasons.

Fujisaki Reference

In the Office Action at page 5, lines 18-20, the Examiner contends that "Fujisaki discloses a method ... wherein one frame is divided into ... plural subfields, and each of subfields (sic) comprise a rest period 61 (a reset period), see figures 11-12."

However, the reset period of Fujisaki et al. is completely different from the rest period of the invention recited in claim 3. This is because the reset period of Fujisaki et al. is not a "rest" period since operations occur during the reset period of the Fujisaki et al. device. (See Fujisaki et al. at column 5, lines 6-15.) Applicants respectfully apologize for confusing the Examiner by the above-mentioned typographical errors in the original specification related to the "reset period."

Thus, Fujisaki et al. does not disclose or suggest "divided rest periods" (as recited in claim 3).

Accordingly, claim 3 patentably distinguishes over Tanaka and is submitted to be allowable.

Claims 7, 15 and 19

Claims 7, 15 and 19 for reasons similar to those of claim 3, are also submitted to be allowable.

Claims 4, 8, 16 and 20

Claims 4, 8, 16 and 20 are also submitted to be allowable for their respective dependencies on claims 3, 7, 15 and 19, as well as for the additional recitations therein.

NEW CLAIMS 25-27

Claims 25-27 are provided to afford a varying scope of protection.

Claim 25 for reasons similar to those of claim 1, is submitted to be allowable.

Claim 26 for reasons similar to those of claim 13, is submitted to be allowable.

Claim 27 is submitted to be allowable for its dependency on claim 9, as well as for the additional recitations therein. For example, claim 27 recites "adjusting a wait time between the front subframe and the rear subframe such that the wait time operates to fix the interval between respective start timings of the front subframe and the rear subframe." Since Tanaka is silent regarding "a wait time," new claim 27 is submitted to have patentable distinctions beyond those of claim 9 from which claim 27 depends.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is respectfully solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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12/5/03

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